Spoken language transfers inf

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AI Overview

A widely cited 2019 study published in *Science Advances* found that disparate human languages transfer information at a remarkably consistent average rate of roughly 39.15 bits per second. While individual languages use very different pacing and structural properties, they balance density and speed to hit this same cognitive bandwidth. Science | AAAS +2

The Trade-Off Between Speed and Density

- **Information Density:** Measured using Shannon entropy to see how much data a single syllable carries (ranging from ~5 bits in languages like Basque or Japanese to ~8 bits in Vietnamese). Medium · Luciano Latouche +1
- **Speech Rate:** Measured in syllables spoken per second (fast-paced languages like Spanish or Italian use lower-density syllables; slower-paced languages like Mandarin or Vietnamese use high-density syllables). Reddit +1
- **The Result:** Multiplying density by speech rate yields the same net information transfer (~39 bits/sec) across different tongues. PubMed Central (PMC) (.gov)

Significance and Limitations

- **Cognitive Limit:** Researchers suggest this uniform rate reflects a fundamental bottleneck in human brain processing and neural/cortical rhythms (such as theta oscillations) during speech production and comprehension. LinkedIn · Dean Mai +1
- **Nuance and Debate:** Discussions on platforms like Reddit show that opinions are mixed. Some critics and linguists question how "information" is operationalized, noting that mathematical information theory (predictability of syllables) is distinct from practical semantic or pragmatic meaning conveyed in casual dialogue. Reddit +1

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by C Coupé · 2019 · Cited by 332 — Human **languages** encode similar average **information** rates (**~39 bits**/s) despite their remarkable differences.

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Oct 29, 2024 — Research reveals **universal information rate in human languages at 39 bits/second**, revolutionising our understanding of communication and AI ...

Sean Trott
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by S Trott · Cited by 1 — **languages convey "information" at roughly the same rate of 39 bits per second**. languages with faster speech rates tend to have lower ...
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Fast talking

all languages convey information at roughly the same speed when all the factors are taken into account: around 39 bits per second.

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